

CLAIMS

What is claimed is:

1. A display device comprising:
 - a display unit adapted to allow a first polarized light to be emitted as display light; and
 - a control unit adapted to control the display unit,
 - wherein the display unit has a polarized light selecting unit on a viewing side thereof,
 - the polarized light selecting unit transmits the first polarized light and reflects a second polarized light having a polarization axis crossing a polarization axis of the first polarized light, and
 - the control unit switches between a display mode, in which the first polarized light is emitted from the display unit as display light, and a mirror mode, in which the first polarized light is not emitted from the display unit.
2. The display device according to claim 1, wherein the control unit stops light emission from the display unit in the mirror mode.
3. A display device having a transmitting polarization axis varying unit, the display device including:
 - a first polarized light selecting unit disposed on a viewing side of the transmitting polarization axis varying unit; and

a second polarized light selecting unit disposed on a backside of the transmitting polarization axis varying unit,

wherein the first polarized light selecting unit transmits a first polarized light and reflects a second polarized light having a polarization axis crossing a polarization axis of the first polarized light,

the second polarized light selecting unit transmits a third polarized light and absorbs or reflects a fourth polarized light having a polarization axis crossing a polarization axis of the third polarized light, and

the transmitting polarization axis varying unit converts at least a part of the third polarized light to the first polarized light.

4. The display device according to claim 3, wherein no other transmitting polarization axis varying unit is disposed on the viewing side of the first polarized light selecting unit.

5. The display device according to claim 3, wherein a third polarized light selecting unit adapted to transmit the first polarized light and to absorb the second polarized light is disposed between the first polarized light selecting unit and the transmitting polarization axis varying unit.

6. The display device according to claim 5 comprising:

a lighting device on the backside of the second polarized light selecting unit,

wherein the second polarized light selecting unit transmits the third polarized light and absorbs the fourth polarized light,

a fourth polarized light selecting unit disposed between the second polarized light selecting unit and the lighting device, and

the fourth polarized light selecting unit transmits the third polarized light and reflects the fourth polarized light.

7. The display device according to claim 3, wherein the second polarized light selecting unit transmits the third polarized light and reflects the fourth polarized light.

8. The display device according to claim 3, wherein a surface on the viewing side of the polarized light selecting unit is flat.

9. The display device according to claim 3, wherein a transparent protective film is formed on a surface on the viewing side of the first polarized light selecting unit.

10. The display device according to claim 3, wherein a lighting unit adapted to emit light to the viewing side is disposed on the backside of the second polarized light selecting unit.

11. The display device according to claim 10, wherein no light reflection component for reflecting outside light to the viewing side in a form supporting display is disposed between the first polarized light selecting unit and the lighting unit.

12. The display device according to claim 10, wherein the transmitting polarization axis varying unit does not emit the first polarized light when the lighting unit is off.

13. The display device according to claim 3, wherein a polarized light selecting area of the first polarized light selecting unit extends beyond an area overlapping a transmitting polarization axis varying area of the transmitting polarization axis varying unit.

14. The display device according to claim 10, wherein a light amount emitted in a normal direction is greatest in an emission angle distribution of luminous light of the lighting unit.

15. The display device according to claim 14, wherein the luminous light of the lighting unit is mainly distributed at an emission angle ranging from zero (0) to forty (40) degrees.

16. The display device according to claim 14, wherein the luminous light of the lighting unit is one fiftieth ($1/50$) or below of a light amount in the normal direction for a range exceeding an emission angle of forty five (45) degrees.
17. The display device according to claim 3, wherein a color filter is disposed on the backside of the first polarized light selecting unit.
18. The display device according to claim 3, wherein a retarder is disposed between the first polarized light selecting unit and the transmitting polarization axis varying unit.
19. The display device according to claim 3, wherein a transparent member is disposed on the viewing side of the first polarized light selecting unit, and the first polarized light selecting unit is directly or indirectly disposed adjacent the transparent member.
20. The display device according to claim 19, wherein the first polarized light selecting unit is bonded to the transparent member by a transparent substance.
21. The display device according to claim 19, wherein a surface of the transparent member on the first polarized light selecting unit is flat.

22. The display device according to claim 19, wherein a surface on the viewing side of the transparent member is curved.

23. An electronic device comprising the display device according to claim 1.

24. An electronic device comprising:
the display device according to claim 3; and
a display drive unit adapted to drive the transmitting polarization axis varying unit.

25. An electronic device comprising:
the display device according to claim 10;
a display drive unit adapted to drive the transmitting polarization axis varying unit; and
a lighting control unit adapted to control the lighting unit.

26. An electronic device comprising a display unit adapted to allow light emission,

wherein the display unit has a polarized light selecting unit adapted to transmit a first polarized light and to reflect a second polarized light having a polarization axis crossing a polarization axis of the first polarized light on a viewing side thereof, and

a transmissive display mode, in which the first polarized light is emitted from the polarized light selecting unit on the viewing side to allow the first polarized light to be observed on the viewing side, and a mirror mode, in which the first polarized light is not emitted from the polarized light selecting unit and the polarized light selecting unit is used as a mirror on the viewing side of display unit, are switchable.

27. The electronic device according to claim 26 further comprising an input part for allowing an operation of the display device or for allowing data input to display in the display device,

wherein the input part is operated to allow switching between the transmissive display mode and the mirror mode.